

Research Program in the Bohemia Spillway in Southeast Louisiana

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Introduction

The Bohemia Spillway area is the 11.8 mile reach on the east bank of the Mississippi River approximately 45 miles downriver of New Orleans extending below the terminus of the Mississippi River (MR&T) levees to Bayou Lamoque (**Figure 1**). The Bohemia Spillway area has a fascinating history that pre-dates the physical creation of the spillway in 1926 by removal of artificial river flood protection levees. Prior to 1926, several small communities had permanent residence along the river bank that were protected by the river by a formidable artificial river levee. When the levee was removed in 1926 to create the spillway, this ended permanent residence within the spillway.



Figure 1: Bohemia Spillway area is east of the Mississippi River downstream of the terminus of the Mississippi River levee (source basemap: SONRIS CIR 2005).

The legal and management history of the Bohemia Spillway since 1926 to the present day is complex and cryptic. 33,000 acres were authorized to be purchased or expropriated in 1924 by the Louisiana State legislature (United States Court of Appeals, the Fifth Circuit, 2002). The land acquired from private holding has been transferred to the heirs of the original landowners in 1984 by an act of the State legislature. The Bohemia Spillway is now primarily used for oil and gas activities, hunting, and as a spillway outlet. Since 1926, it has also been identified as the Pioneer Spillway, the Pointe a la Hache Wildlife Management Area.

Research Program Purpose

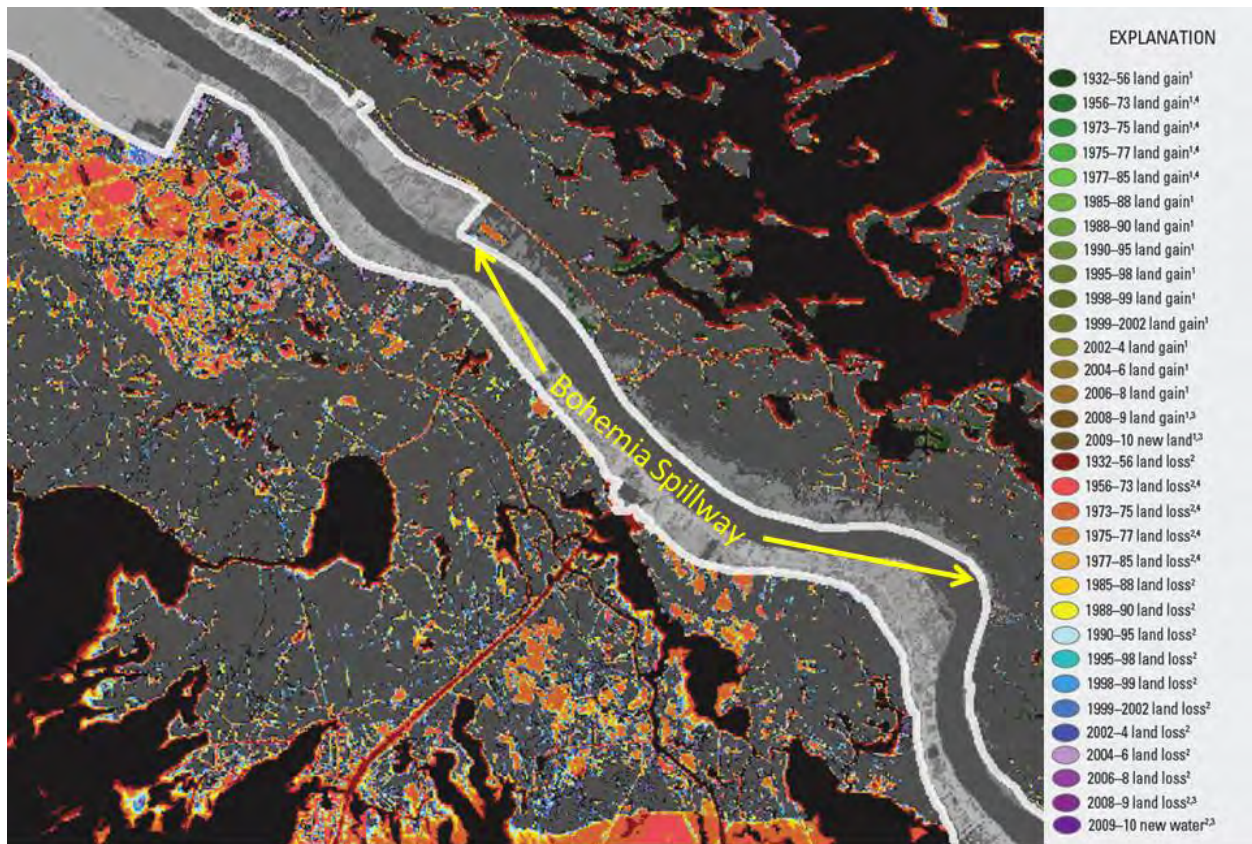
Due to the removal of the artificial river levees in 1926, the Bohemia Spillway provides a truly unique opportunity to investigate a long-term response of wetlands to discharge of the Mississippi River by processes that emulate the natural process of seasonal overbank flow. Because the Bohemia Spillway may be instructive to restoration, LPBF has been investigating the Bohemia Spillway since 2007. This work now spans two significant flood events in 2008 and 2011. In 2010, LPBF completely surveyed the road elevation of the road through Bohemia Spillway. In 2011, extensive hydrologic surveys were conducted (see companion paper)

Three segments of the original river levee are still present in the Bohemia spillway. The total length of levee segments is less than $\frac{1}{2}$ mile representing < 5% of the spillway. These levees appear to be well engineered and often include concrete embankments one or both sides of the levee. The largest segment of original levee is $\frac{1}{4}$ mile long (~8 feet high) is shown in the figure below. It is noteworthy during 2011 flood, the levee segments were not overtopped, indicating that if the all of the levees had not been removed in 1926, they might, even now, have precluded flow through the Bohemia Spillway.



Figure 2: Segment of the pre-1926 levee still present in the Bohemia Spillway. The river (flood side) is on the left side of the levee/road. The elevation of the road bed on the levee is approximately 8 feet NAVD.

An intriguing aspect of the Bohemia Spillway is low rates of land loss (see Figure below). The observed land loss is generally the direct loss due to dredging of canals and due to shoreline erosion near the sound. Other causes of loss do not seem to be active, such as the indirect loss due to oil and gas canals. Rather, what has been observed is that some canals in the Bohemia Spillway have converted to marsh again. This is presumably due to the inorganic and organic accretion that may be resulting from the active spillway. Small amounts of land gain are present.



Couvillion, Brady R., John A. Barras, Gregory D. Steyer, William Sleavin, Michelle Fischer, Holly Beck, Nadine Trahan, Brad Griffin, David Heckman, USGS Land Area Change in Coastal Louisiana (1932 to 2010)

Figure 3: Land Change map comparing east Bohemia Spillway to the west bank patterns of wetlands loss (Couvillion and others, 2011).

LPBF Research Program in the Bohemia Spillway:

- Vibracore program and recent geologic history - Coring was completed in 2010. XRF and age dating are in progress.
- Vegetative mapping – This was based on 2010 field ground-truthing and typical remote sensing imagery. The work is complete except for spoil bank vegetation.
- Geomorphic and image analysis - ongoing
- Hydrologic survey during high and low water – 2011 survey complete
- Hydrologic survey of the river during high water– 2011 survey complete

Basics of the Basin 2011

- Hydrologic modeling - complete
- Forensic study of residual features and paper record of Bohemia management - ongoing
- Land change analysis – ongoing
- Comprehensive synthesis - pending

References Cited

United States Court of Appeals, the Fifth Circuit, 2002 no. 01-30728, Anthony L. Vogt, versus Board of Commissioners of the Orleans Levee District, and James Huey.